

Appendix B1: Survival Factors and Other Parameters Used by PSEG to Estimate I&E Losses at Salem

The tables in this appendix present the survival factors and other parameters used by PSEG to estimate I&E losses at the Salem facility. This information is taken from Appendix L of Salem's 1999 Permit Renewal Application (PSEG, 1999e).

Table B1-1: Parameters Used by PSEG to Calculate Historic Losses for Alewife at the Salem Station, 1978-1998**Entrainment**

	Net Extrusion ^a	Net Avoidance ^a	Mechanical Mortality ^a	Thermal Mortality ^a	Biocide ^a	Recirculation ^a	SWS Mortality ^a
Egg	NA	NA	1		0	0.1	1
Yolk Sac	<4 mm, = 1/0.11; 4-7 mm, = 1/(-1.0767 + 0.2967 * length)	5-32 mm, = 1/(1.13486 - 0.02697 * length); 32-60 mm, = 1/(0.36294 - 0.00285 * length); > 60 mm, = 1/0.1919	0.883	-14.194 - 0.015T _A +2.158 log ₁₀ t + 0.473T _E	0	0.1	1
Post-yolk Sac			0.883		0	0.1	1
Juvenile	NA		0.883		0	0.1	1

Impingement

		Latent Screen Mortality												
	Collection Efficiency ^a	SWS Mortality ^a	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Live ^a (1977-1995)														
Age 0	0.7737	1	1	1	0.992	1	0.996	1	1	1	1	0.709	0.728	0.71
Age 1	0.7737	1	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.763	0.994
Age 2	0.7737	1	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.763	0.994
Damaged ^a (1977-1995)														
Age 0	0.7737	1	1	1	0.992	1	0.996	1	1	1	1	0.709	0.728	0.71
Age 1	0.7737	1	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.763	0.994
Age 2	0.7737	1	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.763	0.994
Live and Damaged ^b (1996-1998)														
Age 0	0.7737	1	0.208	0.208	0.208	0.139	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208
Age 1	0.7737	1	0.208	0.208	0.208	0.139	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208
Age 2	0.7737	1	0.208	0.208	0.208	0.139	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208

T_A = Acclimation temperature, T_E = Exposure temperature, t = transit time.

^a The parameters used by PSEG in the calculation of entrainment and impingement are described in Appendix F, Attachment 2 of the 1999 Salem Application.

^b The parameters used by PSEG in the calculation of entrainment and impingement are described in Appendix G, Attachment 1 of the 1999 Salem Application.

Shaded area = data used by EPA to calculate impingement assuming no survival.

Source: PSEG, 1999e.

Table B1-2: Parameters Used by PSEG to Calculate of Historic Losses for American Shad at the Salem Station, 1978-1998

Entrainment														
	Net Extrusion ^a		Net Avoidance ^a		Mechanical Mortality ^a	Thermal Mortality ^a		Biocide ^a	Recirculation ^a		SWS Mortality ^a			
Egg	NA		NA		1			0		0.1		1		
Yolk Sac	<4 mm, = 1/0.11; 4-7 mm, = 1/(-1.0767 + 0.2967 * length)		5-32 mm, = 1/(1.13486 - 0.02697 * length); 32-60 mm, = 1/(0.36294 - 0.00285 * length); > 60 mm, = 1/0.1919		0.883	-14.194 - 0.015T _A +2.158 log ₁₀ t + 0.473T _E		0		0.1		1		
Post-yolk Sac					0.883			0		0.1		1		
Juvenile	NA				0.883			0		0.1		1		
Impingement														
	Latent Screen Mortality													
	Collection Efficiency ^a	SWS Mortality ^a	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Live ^a (1977-1995)														
Age 0	0.7737	1	0.239	0.61	0.61	0.581	0.61	0.61	0.61	0.61	0.61	0.61	0.286	0.149
Age 1	0.7737	1	0.273	0.273	0.273	0.273	0.273	0.273	0.273	0.273	0.273	0.273	0.273	0.273
Damaged ^a (1977-1995)														
Age 0	0.7737	1	0.239	0.61	0.61	0.581	0.61	0.61	0.61	0.61	0.61	0.61	0.286	0.149
Age 1	0.7737	1	0.273	0.273	0.273	0.273	0.273	0.273	0.273	0.273	0.273	0.273	0.273	0.273
Live and Damaged ^b (1996-1998)														
Age 0	0.7737	1	0.208	0.208	0.208	0.139	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208
Age 1	0.7737	1	0.208	0.208	0.208	0.139	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208

T_A = Acclimation temperature, T_E = Exposure temperature, t = transit time.

^a The parameters used by PSEG in the calculation of entrainment and impingement are described in Appendix F, Attachment 2 of the 1999 Salem Application.

^b The parameters used by PSEG in the calculation of entrainment and impingement are described in Appendix G, Attachment 1 of the 1999 Salem Application.

Shaded area = data used by EPA in the calculation of impingement assuming no survival.

Source: PSEG, 1999e.

Table B1-3: Parameters Used by PSEG to Calculate Historic Losses for Atlantic Croaker at the Salem Station, 1978-1998**Entrainment**

	Net Extrusion ^a	Net Avoidance ^a	Mechanical Mortality ^a	Thermal Mortality ^a	Biocide ^a	Recirculation ^a	SWS Mortality ^a
Egg	NA	NA	1		0	0.1	1
Yolk Sac	<4 mm, = 1/0.11; 4-7 mm, = 1/(-0.0767 + 0.2967 * length)	5-32 mm, = 1/(1.13486 - 0.02697 * length); 32-60 mm, = 1/(0.36294 - 0.00285 * length); > 60 mm, = 1/0.1919	0.36	-35.451 - 0.751T _A + 0 log ₁₀ t + 1.663T _E	0	0.1	1
Post-yolk Sac			0.36		0	0.1	1
Juvenile	NA		0.36		0	0.1	1

Impingement

		Latent Screen Mortality												
	Collection Efficiency ^a	SWS Mortality ^a	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Live ^a (1977-1995)														
Age 0	0.8448	1	0.286	0.286	0.286	0.286	0.286	0.286	0.286	0.286	0.286	0.286	0.286	0.286
Age 1	0.8448	1	0.286	0.286	0.286	0.286	0.286	0.286	0.286	0.286	0.286	0.286	0.286	0.286
Damaged ^a (1977-1995)														
Age 0	0.8448	1	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833
Age 1	0.8448	1	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833	0.833
Live and Damaged ^b (1996-1998)														
Age 0	0.8448	1	0.387	0.387	0.387	0.387	0.313	0.271	0.102	0.387	0.387	0.019	0.005	0.107
Age 1	0.8448	1	0.387	0.387	0.387	0.387	0.313	0.271	0.102	0.387	0.387	0.019	0.005	0.107

T_A = Acclimation temperature, T_E = Exposure temperature, t = transit time.

^a The parameters used by PSEG in the calculation of entrainment and impingement are described in Appendix F, Attachment 2 of the 1999 Salem Application.

^b The parameters used by PSEG in the calculation of entrainment and impingement are described in Appendix G, Attachment 1 of the 1999 Salem Application.

Shaded area = data used by EPA to calculate impingement assuming no survival.

Source: PSEG, 1999e.

Table B1-4: Parameters Used by PSEG to Calculate Historic Losses for Bay Anchovy at the Salem Station, 1978-1998.

Entrainment																					
	Net Extrusion ^a		Net Avoidance ^a		Mechanical Mortality ^a	Thermal Mortality ^a			Biocide ^a	Recirculation ^a		SWS Mortality ^a									
Egg	NA		NA			1			0			0.1	1								
Yolk Sac	<4 mm, = 1/0.11; 4-7 mm, = 1/(-1.0767 + 0.2967 * length)		5-32 mm, = 1/(1.13486 - 0.02697 * length); 32-60 mm, = 1/(0.36294 - 0.00285 * length); > 60 mm, = 1/0.1919			1			-7.751 - 0.174T _A +0.995 log ₁₀ t + 0.427T _E			0	0.1	1							
Post-yolk Sac						1			0			0.1	1								
Juvenile	NA					1			0			0.1	1								
Adult	NA					1			0			0.1	1								
Impingement																					
			Latent Screen Mortality																		
	Collection Efficiency ^a	SWS Mortality ^a	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec							
Live ^a (1977-1995)																					
Age 0	0.7496	1	0.815	0.815	0.815	0.815	0.815	0.815	0.815	0.805	0.81	0.718	0.675	0.815							
Age 1	0.7496	1	0.884	0.884	0.815	0.815	0.718	0.884	0.857	0.805	0.81	0.718	0.675	0.815							
Age 2	0.7496	1	0.884	0.884	0.884	0.815	0.718	0.884	0.857	0.805	0.81	0.718	0.675	0.815							
Age 3	0.7496	1	0.884	0.884	0.884	0.884	0.718	0.884	0.857	0.805	0.81	0.718	0.675	0.815							
Damaged ^a (1977-1995)																					
Age 0	0.7496	1	0.946	1	0.946	1	1	1	1	0.863	0.946	1	0.946	0.946							
Age 1	0.7496	1	1	1	0.946	0.953	0.965	0.908	0.975	0.863	0.946	1	0.946	0.946							
Age 2	0.7496	1	1	1	1	0.953	0.965	0.908	0.975	0.863	0.946	1	0.946	0.946							
Age 3	0.7496	1	1	1	1	1	0.965	0.908	0.975	0.863	0.946	1	0.946	0.946							
Live and Damaged ^b (1996-1998)																					
Age 0	0.7496	1	0.761	0.761	0.761	0.49	0.483	0.741	0.761	0.761	0.761	0.194	0.255	0.761							
Age 1	0.7496	1	0.761	0.761	0.761	0.49	0.483	0.741	0.761	0.761	0.761	0.194	0.255	0.761							
Age 2	0.7496	1	0.761	0.761	0.761	0.49	0.483	0.741	0.761	0.761	0.761	0.194	0.255	0.761							
Age 3	0.7496	1	0.761	0.761	0.761	0.49	0.483	0.741	0.761	0.761	0.761	0.194	0.255	0.761							

T_A = Acclimation temperature, T_E = Exposure temperature, t = transit time.

^a The parameters used by PSEG in the calculation of entrainment and impingement are described in Appendix F, Attachment 2 of the 1999 Salem Application.

^b The parameters used by PSEG in the calculation of entrainment and impingement are described in Appendix G, Attachment 1 of the 1999 Salem Application.

Shaded area = data used by EPA to calculate impingement assuming no survival.

Source: PSEG, 1999e.

Table B1-5: Parameters Used by PSEG to Calculate Historic Losses for Blueback Herring at the Salem Station, 1978-1998.**Entrainment**

	Net Extrusion ^a	Net Avoidance ^a	Mechanical Mortality ^a	Thermal Mortality ^a	Biocide ^a	Recirculation ^a	SWS Mortality ^a
Egg	NA	NA	1		0	0.1	1
Yolk Sac	<4 mm, = 1/0.11; 4-7 mm, = 1/(-0.0767 + 0.2967 * length)	5-32 mm, = 1/(1.13486 - 0.02697 * length); 32-60 mm, = 1/(0.36294 - 0.00285 * length); > 60 mm, = 1/0.1919	0.883	-14.194 - 0.015T _A +2.158 log ₁₀ t + 0.473T _E	0	0.1	1
Post-yolk Sac			0.883		0	0.1	1
Juvenile	NA		0.883		0	0.1	1

Impingement

	Collection Efficiency ^a	SWS Mortality ^a	Latent Screen Mortality											
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Live ^a (1977-1995)														
Age 0	0.7737	1	0.636	0.636	1	1	1	1	1	1	1	0.636	0.636	0.636
Age 1	0.7737	1	1	1	1	1	1	1	1	0.636	0.636	0.636	0.636	0.636
Age 2	0.7737	1	1	1	1	1	1	1	1	0.636	0.636	0.636	0.636	0.636
Age 3	0.7737	1	1	1	1	1	1	1	1	0.636	0.636	0.636	0.636	0.636
Age 4	0.7737	1	1	1	1	1	1	1	1	0.636	0.636	0.636	0.636	0.636
Age 5	0.7737	1	1	1	1	1	1	1	1	0.636	0.636	0.636	0.636	0.636
Damaged ^a (1977-1995)														
Age 0	0.7737	1	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982
Age 1	0.7737	1	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982
Age 2	0.7737	1	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982
Age 3	0.7737	1	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982
Age 4	0.7737	1	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982
Age 5	0.7737	1	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982	0.982
Live and Damaged ^b (1996-1998)														
Age 0	0.7737	1	0.208	0.208	0.208	0.139	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208
Age 1	0.7737	1	0.208	0.208	0.208	0.139	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208
Age 2	0.7737	1	0.208	0.208	0.208	0.139	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208
Age 3	0.7737	1	0.208	0.208	0.208	0.139	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208

Table B1-5: Parameters Used by PSEG to Calculate Historic Losses for Blueback Herring at the Salem Station, 1978-1998 (cont.).**Impingement**

	Collection Efficiency ^a	SWS Mortality ^a	Latent Screen Mortality											
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Live and Damaged ^b (1996-1998)														
Age 4	0.7737	1	0.208	0.208	0.208	0.139	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208
Age 5	0.7737	1	0.208	0.208	0.208	0.139	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208

T_A = Acclimation temperature, T_E = Exposure temperature, t = transit time.

^a The parameters used by PSEG in the calculation of entrainment and impingement are described in Appendix F, Attachment 2 of the 1999 Salem Application.

^b The parameters used by PSEG in the calculation of entrainment and impingement are described in Appendix G, Attachment 1 of the 1999 Salem Application.

Shaded area = data used by EPA to calculate impingement assuming no survival.

Source: PSEG, 1999e.

Table B1-6: Parameters Used by PSEG to Calculate Historic Losses for Spot at the Salem Station, 1978-1998.**Entrainment**

	Net Extrusion ^a	Net Avoidance ^a	Mechanical Mortality ^a	Thermal Mortality ^a	Biocide ^a	Recirculation ^a	SWS Mortality ^a
Egg	NA	NA	1		0	0.1	1
Yolk Sac	<4 mm, = 1/0.11; 4-7 mm, = 1/(1.13486 - 0.02697 * length);	5-32 mm, = 1/(1.13486 - 0.02697 * length); 32-60 mm, = 1/(0.36294 - 0.00285 * length); >60 mm, = 1/0.1919	0.185	-37.16428 - 0.66867 T_A +0 log ₁₀ t + 1.78425 T_E	0	0.1	1
Post-yolk Sac	= 1/(-1.0767 + 0.2967 * length)		0.185		0	0.1	1
Juvenile	NA		0.185		0	0.1	1

Impingement

	Collection Efficiency ^a	SWS Mortality ^a	Latent Screen Mortality											
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Live ^a (1977-1995)														
Age 0	0.7965	1	0.559	0.559	0.559	0.559	0.444	0.11	0.239	0.294	0.382	0.559	0.307	0
Age 1	0.7965	1	0.559	0.559	0.559	0.559	0.444	0.11	0.239	0.294	0.382	0.559	0.307	0
Damaged ^a (1977-1995)														
Age 0	0.7965	1	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Age 1	0.7965	1	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96

Table B1-6: Parameters Used by PSEG to Calculate Historic Losses for Spot at the Salem Station, 1978-1998 (cont.).**Impingement**

	Collection Efficiency ^a	SWS Mortality ^a	Latent Screen Mortality											
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Live and Damaged ^b (1996-1998)														
Age 0	0.7965	1	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045
Age 1	0.7965	1	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045

T_A = Acclimation temperature, T_E = Exposure temperature, t = transit time.

^a The parameters used by PSEG in the calculation of entrainment and impingement are described in Appendix F, Attachment 2 of the 1999 Salem Application.

^b The parameters used by PSEG in the calculation of entrainment and impingement are described in Appendix G, Attachment 1 of the 1999 Salem Application.

Shaded area = data used by EPA to calculate impingement assuming no survival.

Source: PSEG, 1999e.

Table B1-7: Parameters Used by PSEG to Calculate Historic Losses for Striped Bass at the Salem Station, 1978-1998.**Entrainment**

	Net Extrusion ^a	Net Avoidance ^a	Mechanical Mortality ^a	Thermal Mortality ^a	Biocide ^a	Recirculation ^a	SWS Mortality ^a
Egg	NA	NA	1		0	0.1	1
Yolk Sac	<4 mm, = 1/0.11; 4-7 mm, = 1/(1.13486 - 0.02697 * length);	5-32 mm, = 1/(1.13486 - 0.02697 * length); 32-60 mm, = 1/(0.36294 - 0.00285 * length); > 60 mm, = 1/0.1919	0.484	-7.771 - 0.096 T_A +2.300 log ₁₀ t + 0.346 T_E	0	0.1	1
Post-yolk Sac			0.484		0	0.1	1
Juvenile	NA		0.484		0	0.1	1

Impingement

	Collection Efficiency ^a	SWS Mortality ^a	Latent Screen Mortality											
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Live ^a (1977-1995)														
Age 0	0.9269	1	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077
Age 1	0.9269	1	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077
Age 2	0.9269	1	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077
Damaged ^a (1977-1995)														
Age 0	0.9269	1	0.333	0.333	0.333	0.333	0.333	0.333	0.333	0.333	0.333	0.333	0.333	0.333
Age 1	0.9269	1	0.333	0.333	0.333	0.333	0.333	0.333	0.333	0.333	0.333	0.333	0.333	0.333
Age 2	0.9269	1	0.333	0.333	0.333	0.333	0.333	0.333	0.333	0.333	0.333	0.333	0.333	0.333

Table B1-7: Parameters Used by PSEG to Calculate Historic Losses for Striped Bass at the Salem Station, 1978-1998 (cont.).**Impingement**

	Collection Efficiency ^a	SWS Mortality ^a	Latent Screen Mortality											
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Live and Damaged ^b (1996-1998)														
Age 0	0.9269	1	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.054	0.015
Age 1	0.9269	1	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.054	0.015
Age 2	0.9269	1	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.054	0.015

T_A = Acclimation temperature, T_E = Exposure temperature, t = transit time.

^a The parameters used by PSEG in the calculation of entrainment and impingement are described in Appendix F, Attachment 2 of the 1999 Salem Application.

^b The parameters used by PSEG in the calculation of entrainment and impingement are described in Appendix G, Attachment 1 of the 1999 Salem Application.

Shaded area = data used by EPA to calculate impingement assuming no survival.

Source: PSEG, 1999e.

Table B1-8: Parameters Used by PSEG to Calculate Historic Losses for Weakfish at the Salem Station, 1978-1998.**Entrainment**

	Net Extrusion ^a	Net Avoidance ^a	Mechanical Mortality ^a	Thermal Mortality ^a	Biocide ^a	Recirculation ^a	SWS Mortality ^a
Egg	NA	NA	1		0	0.1	1
Yolk Sac	<4 mm, = 1/0.11; 4-7 mm, = 1/(-1.0767 + 0.2967 * length)	5-32 mm, = 1/(1.13486 - 0.02697 * length); 32-60 mm, = 1/(0.36294 - 0.00285 * length); > 60 mm, = 1/0.1919	0.64 0.64 0.5	-9.01577 - 0.09229 T_A +1.2856 log ₁₀ t + 0.42717 T_E	0 0 0	0.1 0.1 0.1	1 1 1
Post-yolk Sac							
Juvenile	NA						

Impingement

	Collection Efficiency ^a	SWS Mortality ^a	Latent Screen Mortality											
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Live ^a (1977-1995)														
Age 0	0.7915	1	0.563	0.563	0.563	0.563	0.563	0.274	0.346	0.422	0.334	0.563	0.376	0.376
Age 1	0.7915	1	0.422	0.422	0.422	0.422	0.422	0.274	0.346	0.422	0.334	0.422	0.422	0.422
Damaged ^a (1977-1995)														
Age 0	0.7915	1	0.864	0.864	0.864	0.864	0.864	0.781	0.767	0.784	0.734	0.864	0.781	0.781
Age 1	0.7915	1	0.781	0.781	0.781	0.781	0.781	0.781	0.767	0.784	0.734	0.781	0.781	0.781

Table B1-8: Parameters Used by PSEG to Calculate Historic Losses for Weakfish at the Salem Station, 1978-1998 (cont.).**Impingement**

Collection Efficiency ^a	SWS Mortality ^a	Latent Screen Mortality											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Live and Damaged ^b (1996-1998)													
Age 0	0.7915	1	0.579	0.579	0.579	0.579	0.579	0.494	0.579	0.315	0.079	0.579	0.579
Age 1	0.7915	1	0.579	0.579	0.579	0.579	0.579	0.494	0.579	0.315	0.079	0.579	0.579

T_A = Acclimation temperature, T_E = Exposure temperature, t = transit time.

^a The parameters used by PSEG in the calculation of entrainment and impingement are described in Appendix F, Attachment 2 of the 1999 Salem Application.

^b The parameters used by PSEG in the calculation of entrainment and impingement are described in Appendix G, Attachment 1 of the 1999 Salem Application.

Shaded area = data used by EPA to calculate impingement assuming no survival.

Source: PSEG, 1999e.

Table B1-9: Parameters Used by PSEG to Calculate Historic Losses for White Perch at the Salem Station, 1978-1998.**Entrainment**

	Net Extrusion ^a	Net Avoidance ^a	Mechanical Mortality ^a	Thermal Mortality ^a	Biocide ^a	Recirculation ^a	SWS Mortality ^a
Egg	NA	NA	1	= -7.594 - 0.063T _A +4.057 log ₁₀ t + 0.308T _E	0	0.1	1
Yolk Sac	<4 mm, = 1/0.11; 4-7 mm, = 1/(1.13486 - 0.02697 * length);	5-32 mm, = 1/(1.13486 - 0.02697 * length); 32-60 mm, = 1/(0.36294 - 0.00285 * length); > 60 mm, = 1/0.1919	0.829	= -15.814 - 0.112T _A +2.796 log ₁₀ t + 0.545T _E	0	0.1	1
Post-yolk Sac			0.829	= -7.594 - 0.063T _A +4.057 log ₁₀ t + 0.308T _E	0	0.1	1
Juvenile	NA		0.829	= -7.594 - 0.063T _A +4.057 log ₁₀ t + 0.308T _E	0	0.1	1

Impingement

Collection Efficiency ^a	SWS Mortality ^a	Latent Screen Mortality												
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Live ^a (1977-1995)														
Age 0	0.9269	1	0	0	0.072	0.13	0	0.044	0.044	0.044	0.044	0.021	0.025	0.015
Age 1	0.9269	1	0	0	0.072	0.13	0	0.044	0.044	0.044	0.044	0.021	0.025	0.015
Age 2	0.9269	1	0	0	0.072	0.13	0	0.044	0.044	0.044	0.044	0.021	0.025	0.015
Age 3	0.9269	1	0	0	0.072	0.13	0	0.044	0.044	0.044	0.044	0.021	0.025	0.015
Age 4	0.9269	1	0	0	0.072	0.13	0	0.044	0.044	0.044	0.044	0.021	0.025	0.015
Age 5	0.9269	1	0	0	0.072	0.13	0	0.044	0.044	0.044	0.044	0.021	0.025	0.015

Table B1-9: Parameters Used by PSEG to Calculate Historic Losses for White Perch at the Salem Station, 1978-1998 (cont).**Impingement**

	Collection Efficiency ^a	SWS Mortality ^a	Latent Screen Mortality											
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Live ^a (1977-1995)														
Age 6	0.9269	1	0	0	0.072	0.13	0	0.044	0.044	0.044	0.044	0.021	0.025	0.015
Age 7	0.9269	1	0	0	0.072	0.13	0	0.044	0.044	0.044	0.044	0.021	0.025	0.015
Age 8	0.9269	1	0	0	0.072	0.13	0	0.044	0.044	0.044	0.044	0.021	0.025	0.015
Damaged ^a (1977-1995)														
Age 0	0.9269	1	0.84	0.974	0.672	0.97	0.815	0.75	0.405	0.405	0.405	0.639	0.655	0.84
Age 1	0.9269	1	0.84	0.974	0.672	0.97	0.815	0.75	0.405	0.405	0.405	0.639	0.655	0.84
Age 2	0.9269	1	0.84	0.974	0.672	0.97	0.815	0.75	0.405	0.405	0.405	0.639	0.655	0.84
Age 3	0.9269	1	0.84	0.974	0.672	0.97	0.815	0.75	0.405	0.405	0.405	0.639	0.655	0.84
Age 4	0.9269	1	0.84	0.974	0.672	0.97	0.815	0.75	0.405	0.405	0.405	0.639	0.655	0.84
Age 5	0.9269	1	0.84	0.974	0.672	0.97	0.815	0.75	0.405	0.405	0.405	0.639	0.655	0.84
Age 6	0.9269	1	0.84	0.974	0.672	0.97	0.815	0.75	0.405	0.405	0.405	0.639	0.655	0.84
Age 7	0.9269	1	0.84	0.974	0.672	0.97	0.815	0.75	0.405	0.405	0.405	0.639	0.655	0.84
Age 8	0.9269	1	0.84	0.974	0.672	0.97	0.815	0.75	0.405	0.405	0.405	0.639	0.655	0.84
Live and Damaged ^b (1996-1998)														
Age 0	0.9269	1	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.054	0.015
Age 1	0.9269	1	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.054	0.015
Age 2	0.9269	1	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.054	0.015
Age 3	0.9269	1	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.054	0.015
Age 4	0.9269	1	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.054	0.015
Age 5	0.9269	1	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.054	0.015
Age 6	0.9269	1	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.054	0.015
Age 7	0.9269	1	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.054	0.015
Age 8	0.9269	1	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.054	0.015

T_A = Acclimation temperature, T_E = Exposure temperature, t = transit time.

^a The parameters used by PSEG in the calculation of entrainment and impingement are described in Appendix F, Attachment 2 of PSEG, 1999e.

^b The parameters used by PSEG in the calculation of entrainment and impingement are described in Appendix L, Attachment 4 of PSEG, 1999e.

Shaded area = data used in the calculation of impingement losses assuming no survival.

Source: PSEG, 1999e.

Table B1-10: Parameters Used by PSEG to Calculate Historic Losses for *Gammarus* sp. at the Salem Station, 1978–1998.**Entrainment**

	Net Extrusion ^a	Net Avoidance ^a	Mechanical Mortality ^a	Thermal Mortality ^a	Biocide ^a	Recirculation ^a	SWS Mortality ^a
All life stages	NA	1.25	0.014	-11.942 - 0.269T _A +1.205 log ₁₀ t + 0.585T _E	0	0.1	1

T_A = Acclimation temperature, T_E = Exposure temperature, t = transit time.

^a The parameters used by PSEG in the calculation of entrainment and impingement are described in Appendix F, Attachment 2 of the 1999 Salem Application.

Source: PSEG, 1999e.

Table B1-11: Parameters Used by PSEG to Calculate Historic Losses for *Neomysis americana* at the Salem Station, 1978–1998.**Entrainment**

	Net Extrusion ^a	Net Avoidance ^a	Mechanical Mortality ^a	Thermal Mortality ^a	Biocide ^a	Recirculation ^a	SWS Mortality ^a
All life stages	NA	1.25	0.1151	-9.444 - 0.133T _A +1.3301 log ₁₀ t + 0.486T _E	0	0.1	1

T_A = Acclimation temperature, T_E = Exposure temperature, t = transit time.

^a The parameters used by PSEG in the calculation of entrainment and impingement are described in Appendix F, Attachment 2 of the 1999 Salem Application.

Source: PSEG, 1999e.

Table B1-12: Parameters Used by PSEG to Calculate Historic Losses for Blue Crab at the Salem Station, 1978–1998.**Impingement**

	Collection Efficiency ^a	SWS Mortality ^a	Latent Screen Mortality											
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Live ^a (1977-1995)														
Age 0	0.7496	1	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Age 1	0.7496	1	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Age 2	0.7496	1	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Age 3	0.7496	1	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Damaged ^a (1977-1995)														
Age 0	0.7496	1	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Age 1	0.7496	1	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Age 2	0.7496	1	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Age 3	0.7496	1	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50

Table B1-12: Parameters Used by PSEG to Calculate Historic Losses for Blue Crab at the Salem Station, 1978-1998 (cont.).**Impingement**

	Collection Efficiency ^a	SWS Mortality ^a	Latent Screen Mortality											
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Live and Damaged ^b (1996-1998)														
Age 0	0.7496	1	0.182	0.023	0.023	0.026	0.024	0.023	0.026	0.025	0.023	0.023	0.023	0.031
Age 1	0.7496	1	0.182	0.023	0.023	0.026	0.024	0.023	0.026	0.025	0.023	0.023	0.023	0.031
Age 2	0.7496	1	0.182	0.023	0.023	0.026	0.024	0.023	0.026	0.025	0.023	0.023	0.023	0.031
Age 3	0.7496	1	0.182	0.023	0.023	0.026	0.024	0.023	0.026	0.025	0.023	0.023	0.023	0.031

^a The parameters used by PSEG in the calculation of entrainment and impingement are described in Appendix F, Attachment 2 of the 1999 Salem Application.

^b The parameters used by PSEG in the calculation of entrainment and impingement are described in Appendix G, Attachment 2 of the 1999 Salem Application.

Shaded area = data used by EPA to calculate impingement assuming no survival.

Source: PSEG, 1999e.

Table B1-13: Initial Impingement Mortality, Old and New Screens, as Used by PSEG to Calculate Impingement.

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
SGS Initial Impingement Mortality (Old Screens, 1977-1995)												
Blue crab	40.0%	60.0%	22.2%	1.0%	1.2%	2.7%	2.2%	1.6%	1.6%	1.0%	0.1%	0.3%
Blueback herring	14.5%	25.3%	17.0%	18.0%	22.9%	25.0%	19.0%	43.5%	7.7%	13.9%	12.3%	14.9%
Alewife	12.5%	12.6%	8.6%	19.7%	14.1%	26.4%	25.0%	20.0%	15.4%	55.8%	8.0%	7.6%
American shad	5.7%	5.1%	10.3%	16.7%	10.5%	NA	50.0%	66.7%	NA	7.9%	9.3%	10.1%
Bay anchovy	54.9%	41.7%	42.9%	34.3%	35.5%	41.6%	49.0%	39.9%	27.5%	20.3%	21.7%	21.8%
White perch	8.9%	5.3%	8.0%	7.1%	18.4%	17.6%	17.3%	16.1%	10.3%	9.5%	7.2%	7.4%
Striped bass	5.7%	3.8%	8.0%	8.2%	7.7%	2.6%	5.6%	8.8%	18.2%	3.8%	3.5%	5.0%
Weakfish	NA	NA	NA	NA	16.7%	43.8%	22.8%	18.2%	12.3%	9.3%	13.7%	10.0%
Spot	8.4%	NA	NA	NA	21.1%	18.7%	24.5%	20.2%	19.8%	10.6%	9.7%	9.8%
Atlantic croaker	23.4%	12.1%	NA	NA	11.5%	14.3%	16.7%	16.7%	3.0%	3.5%	5.3%	19.2%
SGS Initial Impingement Mortality (New Screens, 1996-1998)												
Blue crab	NA	20.0%	8.3%	2.2%	0.5%	0.4%	0.5%	1.0%	1.7%	1.0%	2.4%	NA
Blueback herring	2.1%	2.1%	2.6%	3.4%	NA	NA	NA	NA	9.1%	2.6%	NA	2.7%
Alewife	NA	8.3%	5.3%	0.0%	NA	NA	50.0%	NA	NA	25.0%	3.7%	NA
American shad	33.3%	NA	33.3%									
Bay anchovy	18.0%	40.0%	9.1%	36.9%	14.3%	11.1%	16.3%	15.7%	19.4%	21.7%	14.4%	40.0%
White perch	2.6%	0.9%	1.8%	0.7%	2.1%	11.6%	3.9%	NA	2.6%	0.9%	0.5%	0.7%

Table B1-13: Initial Impingement Mortality, Old and New Screens, as Used by PSEG to Calculate Impingement (cont.).

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
SGS Initial Impingement Mortality (New Screens, 1996-1998)												
Striped bass	NA	2.1%	1.1%	1.8%	NA	6.7%	5.8%	7.8%	NA	NA	2.4%	NA
Weakfish	NA	NA	NA	NA	NA	10.5%	13.1%	6.5%	3.7%	2.5%	NA	NA
Spot	2.4%	NA	NA	NA	NA	5.0%	12.5%	NA	2.4%	3.0%	2.3%	4.4%
Atlantic croaker	19.1%	10.6%	11.9%	3.1%	4.6%	2.9%	6.5%	7.4%	2.7%	1.9%	3.0%	5.4%

Shaded area = data used by EPA to calculate impingement assuming no survival.

Source: PSEG, 1999c.